AMERICAN WHEATLEY

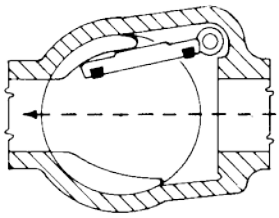
American Wheatley HVAC TDV/TSV Valve Installation, Operation & Maintenance Instructions

DESIGN AND OPERATION:

The principle of operation for the TDV/TSV valve is extremely simple. When in the open position, the clapper swings out of the flow. If the flow stops, the spring allows the clapper to close.

When closing the valve, a final “bumping” action with a wrench gives the final positive seal closure.

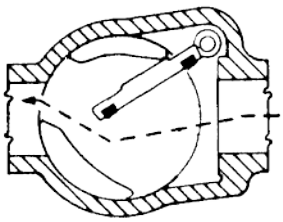
Open Position
With the plug in the open position, the clapper operates as an efficient check valve. The clapper being hinged at an angle provides 90% less dead weight to minimize clapper slam and chatter.



INSTALLATION:

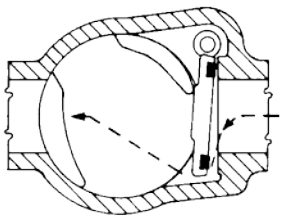
In order to prevent any objectionable system noise, or damage to the check valve functional components, mounting of the triple duty valve directly to the pump is not recommended. The placement of the triple duty valve directly on the pump discharge places the valve directly into a point of high turbulence, and extreme variances in flow and pressure changes. If the valve is placed at this point, damage to the clapper is almost certain.

Balancing
The plug holds the clapper at the selected flow requirement for balancing.



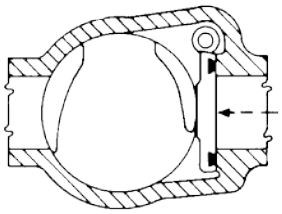
When mounted near the pump, at a minimum, the Triple Duty Valves should be mounted to a spool piece on the discharge side of the pump. It is recommended that a spool piece of 12" minimum be used on pumps with a discharge size of 1.5" through 6" and a 24" minimum spool piece be used for discharge sizes 8"through 12". When installed elsewhere in the system, the velocity and pressure changes are acceptable under normal operation.

Closed Downstream
As the plug is rotated toward the closed position, the downstream part closes first. This equalizes the Pressure so the clapper closes with little resistance.



However, for optimum operation as a balance device measuring differential pressure, it is recommended that a distance of 10 pipe diameters straight pipe be installed upstream of the TDV and 5 times the pipe diameter downstream.

Positive Seal Closure
Final closing is accomplished by the plug camming against the back of the clapper.



The triple duty valve are not to be left in a fully open position, they are designed to create a pressure drop to

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ensure that the pump is operating at design. The triple duty valve must be closed at least 10% to ensure proper function. The valve must be installed with the stem pointing upward vertically, or sideways horizontally. Do NOT install the valve with the stem pointing downward as premature failure could occur.

HANDLES-Once initial settings have been reached at start up, remove handles from valve to prevent unwanted movement.

MAINTENANCE:

The TDV/TSV valve requires no day-to-day maintenance or lubrication, but it is suggested that the valve be operated once a month to assure it is in operable condition.

If at any time it is suspected that the valve is leaking, either in the plug position or as a check, it is possible that foreign particles are trapped between the mating faces of the seal and seat, and are preventing tight seal action. Cycling the valve from full open to full close causes a jetting action that will wash away foreign particles that may be trapped. Also, cycling the valve will usually squeeze any build-up away from the seat mating faces and allow tight shut-off again.

It is not uncommon to discover that when a TDV/TSV valve has been reported leaking in the closed position, that the valve is actually not completely closed. The cam-based design of the TDV/TSV valve makes it almost impossible to over-close. The TDV/TSV is designed to close at an approximate ninety degree rotation of the plug stem. To close the valve, rotate the stem one quarter turn and tighten.

The TDV/TSV wrench is specially suited for the cam-based design of the valve to assure a positive closure. The most satisfactory closure is accomplished by turning the plug to a tight fit and then “bumping” the plug lightly using the TDV/TSV wrench. The use of cheater or a hand wheel should not be necessary.

If these procedures have been completed and a tight seal is still not apparent, the valve should be disassembled and inspected for damage of the clapper seal and seat face, or for excessive wear of the clapper pin and pin hanger supports.

For balancing procedures, please refer to the TDV/TSV Submittal Data Sheet.

Failure to follow these guidelines may result in the failure of the Triple Duty Valve to accomplish any or all of the functions for which it was designed, and can void any implied warranty.

AMERICAN WHEATLEY HVAC WILL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF ITS PRODUCTS OR ANY INCIDENTAL COSTS OF REMOVING OR REPLACING DEFECTIVE PRODUCTS.

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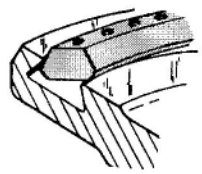
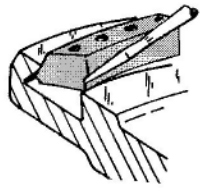
REPAIR CLAPPER SEAL:

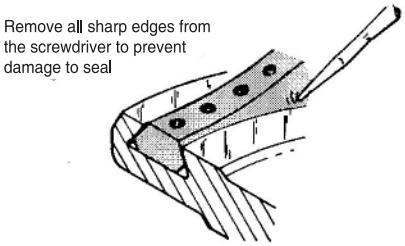
HVAC TDV/TSV (Plugaroo) valves are equipped with Buna-N clapper seals. If the clapper seal is damaged, they can be replaced by removing the clapper and installing a new seal (see steps 1-3 below).



Step 1
Place the outer edge of the seal into the clapper grove as shown.



Step 2
Using a blunt screwdriver, force the inside lower edge of the seal into the clapper groove.



Step 3
As you work the seal in, maintain force on the portion of the seal that has been installed. This will prevent elongation and excessive build-up of closing portion.

Figure 1

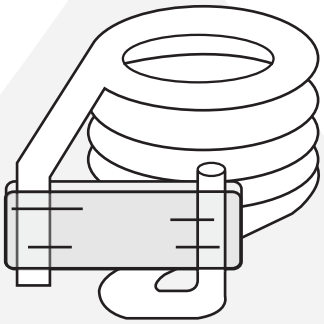
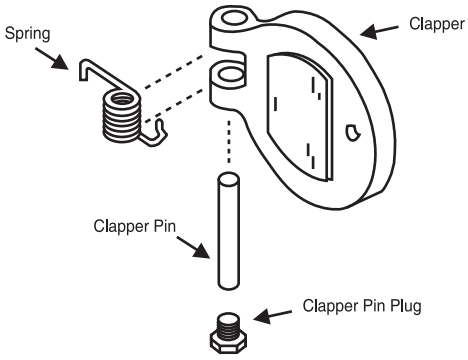


Figure 2



REPLACEMENT PROCEDURE:

(1.) Position clapper firmly against the seat face.
(2.) Pre-load spring and bind using filament tape (see Figure #1 at right).
(3.) Take the clapper pin with the extension screw and insert the pin into the spring and support hangers (see Figure #2 at right).
(4.) When holding the clapper firmly against the seat, the clapper pin must move freely into position.
(5.) Remove the extension screw, replace the clapper pin plug, and cut the filament tape to free the spring.
(6.) Check the clapper for free movement by opening and closing the clapper by hand.
(7.) If movement is free, complete the valve assembly.

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